

Claims

1. A method for contouring a workpiece for the manufacture of an automotive fuel tank filler tube or an automotive instrument panel support beam, said method including the steps of:

5 selecting a starting metal tube having a uniform wall thickness along the length thereof and a constant outside diameter substantially the same outside diameter as desired for producing a first constituent of length in a workpiece for the manufacture of an automotive fuel tank filler tube or an automotive instrument panel support beam; and

 drawing said starting metal tube only partly through a contoured die or only partly

10 through each one of a succession of contoured dies to reduce the outer diameter essentially only along a part of said starting metal tube without producing an appreciable increase to said uniform wall thickness for producing a second constituent of length in said workpiece for the manufacture of an automotive fuel tank filler tube or an automotive instrument panel support beam.

15 2. The method according to claim 1 wherein said step of drawing includes using tension only to apply contact pressure on said contoured die or said contoured dies by said starting metal tube to maintain essentially the same wall thickness along the reduced outer diameter of said tubular work piece along said second constituent of length .

 3. The method according to claim 1 including the further step of working the

20 metal of said starting metal tube concurrently with said step of drawing to form said second length in said workpiece for manufacture of an automotive instrument panel support beam.

4. The method according to claim 3 wherein said step of working the metal of said starting metal tube includes contacting an internal wall section of said starting metal tube confronting said contoured die or said contoured dies with a mandrel concurrently with using tension to apply contact pressure on said contoured die or said contoured dies to both reduce the wall thickness and reduce the outer diameter along said second constituent of length in said workpiece for manufacture of an automotive instrument panel support beam.

5. The method according to claim 3 wherein said step of contacting an internal wall of said tubular work piece includes seating a mandrel into the inside diameter at a pointed end of said tubular work piece to a site confronting said contoured die or said contoured dies.

6. The method according to claim 1 wherein a constituent length of said starting metal tube residing in said contoured die or contoured dies produces a tapering outside diameter ranging between said first constituent and said second constituent of length in said workpiece for the manufacture of an automotive instrument panel support beam.

7. The method according to claim 1 including the further step of cutting an increment of length from at least one end of said starting metal tube to define a desired aggregate length of said workpiece for the manufacture of an automotive instrument panel support beam.

8. The method according to claim 1 including the further step of forming a push pointed end segment on said starting metal tube for establishing a desired outside diameter for said step of drawing said starting metal tube.

9. The method according to claim 8 including the further step of severing said push pointed end from said starting metal tube following said step of drawing said starting metal tube.

10. A method for contouring a workpiece for the manufacture of an automotive fuel tank filler tube or an automotive instrument panel support beam, said method including the steps of:

5 selecting a starting metal tube having a substantially uniform wall thickness along the length thereof and a substantially constant outside diameter corresponding to a desired outside diameter for producing a first constituent of length in a workpiece for the manufacture of an automotive fuel tank filler tube or an automotive instrument panel support beam; and

10 drawing said starting metal tube only partly through each one of a succession of contoured dies by stopping a first drawing motion by detecting a predetermined displacement of said starting metal tube from the contour of the contoured die to reduce the outer diameter essentially only along a part of said starting metal tube without producing an appreciable increase to said uniform wall thickness for producing a second constituent of length in said workpiece for the manufacture of an automotive instrument panel support beam.

15 11. The method of according to claim 10 wherein said step of drawing said starting metal tube further includes stopping a second drawing motion by sensing an increase to a drawing force developed when the contour of the contoured die contacts the contour developed by the preceding contoured die to thereby form a continuous smooth contour tapering wall section ranging in diameters between said first constituent and said second constituent of lengths in said workpiece for the manufacture of an automotive instrument panel support beam.

20 12. The method of according to claim 11 including the step of using said contoured die to form a conical transition between said first constituent and said second constituent of lengths in said workpiece.

13. The method of according to claim 12 wherein said step of using said contoured die to form a conical transition is further defined by an included angle within the range of 20 to 30 degrees.

14. The method of according to claim 13 wherein said included angle is in the
5 range of 22 to 24 degrees.

15. The method of according to claim 10 wherein said starting metal tube is a welded steel.

16. The method of according to claim 15 wherein said starting metal tube is round.

10 17. The method of according to claim 15 wherein said starting metal tube is rectangular.

18. The method of according to claim 11 including the step of using said contoured die to form two spaced apart conical transitions between said first constituent and said second constituent of lengths in said workpiece.

15 19. The method of according to claim 18 wherein said step of using said contoured die to form two conical transitions is further defined by an included angle within the range of 20 to 30 degrees.

20. The method of according to claim 19 wherein said included angle is in the range of 22 to 24 degrees.

20 21. A method for contouring a workpiece for an article of manufacture, the method including the steps of selecting a starting metal tube having a uniform wall thickness

along the length thereof and a constant outside diameter substantially the same outside diameter as desired for producing a first constituent of length desired for the contoured workpiece, and drawing said starting metal tube only partly through a contoured die or only partly through each one of a succession of contoured dies to reduce the outer diameter essentially only along a part of
5 said starting metal tube without producing an appreciable increase to the uniform wall thickness for producing a desired diameter along a second constituent length desired for the contoured workpiece.